

# SEQUENCE LISTING

<110> Zhang, Xiaokui  
Wrzeszczynska, Melissa H  
Horvath, Curt M  
Darnell Jr., James E

<120> METHODS FOR IDENTIFYING MODULATORS OF TRANSCRIPTIONAL ACTIVATOR PROTEIN INTERACTIONS

<130> 600-1-253

<140> 09/387,418  
<141> 1999-08-31

<160> 43

<170> PatentIn Ver. 2.0

<210> 1  
<211> 39  
<212> DNA  
<213> Mus musculus

<220>  
<223> Description of Artificial Sequence: Primer

<400> 1  
caccacaacag ccgccgtagc aacagagaag cagvagatg 39

<210> 2  
<211> 39  
<212> DNA  
<213> Mus musculus

<220>  
<223> Description of Artificial Sequence: Primer

<400> 2  
gccgtagtga cagagaaggc acagatgttg gacgagcat 39

<210> 3  
<211> 51  
<212> DNA  
<213> Mus musculus

<220>  
<223> Description of Artificial Sequence: Primer

<400> 3  
gccgtagtga cagagaagca gcagatggca gacgagcatc ttcaggatgt c 51

<210> 4  
<211> 34  
<212> DNA  
<213> Mus musculus

<220>  
<223> Description of Artificial Sequence: Primer

<400> 4

atgttgagc agcatgctca ggaatgccg aagc

34

<210> 5

<211> 35

<212> DNA

<213> Mus musculus

<220>

<223> Description of Artificial Sequence: Primer

<400> 5

gcagcatctt caggatgcac ggaagcgagt gcagg

35

<210> 6

<211> 58

<212> DNA

<213> Mus musculus

<220>

<223> Description of Artificial Sequence: Primer

<400> 6

caactcagga aatttgacca gcaacgagc tgccgtggca aactggacac cagtcttg

58

<210> 7

<211> 17

<212> DNA

<213> Mus musculus

<220>

<223> Description of Artificial Sequence: Primer

<400> 7

aatccttctg ggaattc

17

<210> 8

<211> 154

<212> PRT

<213> Mus musculus

<400> 8

Met Ala Gln Trp Asn Gln Leu Gln Leu Asp Thr Arg Tyr Leu Lys  
1 5 10 15

Gln Leu His Gln Leu Tyr Ser Asp Thr Phe Pro Met Glu Leu Arg Gln  
20 25 30

Phe Leu Ala Pro Trp Ile Glu Ser Gln Asp Trp Ala Tyr Ala Ala Ser  
35 40 45

Lys Glu Ser His Ala Thr Leu Val Phe His Asn Leu Leu Gly Glu Ile  
50 55 60

Asp Gln Gln Tyr Ser Arg Phe Leu Gln Glu Ser Asn Val Leu Tyr Gln  
65 70 75 80

His Asn Leu Arg Arg Ile Lys Gln Phe Leu Gln Ser Arg Tyr Leu Glu  
85 90 95

Lys Pro Met Glu Ile Ala Arg Ile Val Ala Arg Cys Leu Trp Glu Glu  
100 105 110





Ile Gln Ser Val Glu Pro Tyr Thr Lys Gln Gln Leu Asn Asn Met Ser  
260 265 270

Phe Ala Glu Ile Ile Met Gly Tyr Lys Ile Met Asp Ala Thr Asn Ile  
275 280 285

Leu Val Ser Pro Leu Val Tyr Leu Tyr Pro Asp Ile Pro Lys Glu Glu  
290 295 300

Ala Phe Gly Lys Tyr Cys Arg Pro Glu Ser Gln Glu His Pro Glu Ala  
305 310 315 320

Asp Pro Gly Ser Ala Ala Pro Tyr Leu Lys Thr Lys Phe Ile Cys Val  
325 330 335

Thr Pro Thr Thr Cys Ser Asn Thr Ile Asp Leu Pro Met Ser Pro Arg  
340 345 350

Thr Leu Asp Ser Leu Met Gln Phe Gly Asn Asn Gly Glu Gly Ala Glu  
355 360 365

Pro Ser Ala Gly Gly Gln Phe Glu Ser Leu Thr Phe Asp Met Asp Leu  
370 375 380

Thr Ser Glu Cys Ala Thr Ser Pro Met  
385 390

<210> 11

<211> 154

<212> PRT

<213> Mus musculus

<400> 11

Met Ser Gln Trp Tyr Glu Leu Gln Gln Leu Asp Ser Lys Phe Leu Glu  
1 5 10 15

Gln Val His Gln Leu Tyr Asp Asp Ser Phe Pro Met Glu Ile Arg Gln  
20 25 30

Tyr Leu Ala Gln Trp Leu Glu Lys Gln Asp Trp Glu His Ala Ala Asn  
35 40 45

Asp Val Ser Phe Ala Thr Ile Arg Phe His Asp Leu Leu Ser Gln Leu  
50 55 60

Asp Asp Gln Tyr Ser Arg Phe Ser Leu Glu Asn Asn Phe Leu Leu Gln  
65 70 75 80

His Asn Ile Arg Lys Ser Lys Arg Asn Leu Gln Asp Asn Phe Gln Glu  
85 90 95

Asp Pro Ile Gln Met Ser Met Ile Ile Tyr Ser Cys Leu Lys Glu Glu  
100 105 110

Arg Lys Ile Leu Glu Asn Ala Gln Arg Phe Asn Gln Ala Gln Ser Gly  
115 120 125

Asn Ile Gln Ser Thr Val Met Leu Asp Lys Gln Lys Glu Leu Asp Ser  
130 135 140

1234567891011121314151617181920212223242526272829303132333435363738394041424344454647484950515253545556575859606162636465666768697071727374757677787980818283848586878889909192939495969798991001011021031041051061071081091101111121131141151161171181191201211221231241251261271281291301311321331341351361371381391401411421431441451461471481491501511521531541551561571581591601611621631641651661671681691701711721731741751761771781791801811821831841851861871881891901911921931941951961971981992002012022032042052062072082092102112122132142152162172182192202212222232242252262272282292302312322332342352362372382392402412422432442452462472482492502512522532542552562572582592602612622632642652662672682692702712722732742752762772782792802812822832842852862872882892902912922932942952962972982993003013023033043053063073083093103113123133143153163173183193203213223233243253263273283293303313323333343353363373383393403413423433443453463473483493503513523533543553563573583593603613623633643653663673683693703713723733743753763773783793803813823833843853863873883893903913923933943953963973983994004014024034044054064074084094104114124134144154164174184194204214224234244254264274284294304314324334344354364374384394404414424434444454464474484494504514524534544554564574584594604614624634644654664674684694704714724734744754764774784794804814824834844854864874884894904914924934944954964974984995005015025035045055065075085095105115125135145155165175185195205215225235245255265275285295305315325335345355365375385395405415425435445455465475485495505515525535545555565575585595605615625635645655665675685695705715725735745755765775785795805815825835845855865875885895905915925935945955965975985996006016026036046056066076086096106116126136146156166176186196206216226236246256266276286296306316326336346356366376386396406416426436446456466476486496506516526536546556566576586596606616626636646656666676686696706716726736746756766776786796806816826836846856866876886896906916926936946956966976986997007017027037047057067077087097107117127137147157167177187197207217227237247257267277287297307317327337347357367377387397407417427437447457467477487497507517527537547557567577587597607617627637647657667677687697707717727737747757767777787797807817827837847857867877887897907917927937947957967977987998008018028038048058068078088098108118128138148158168178188198208218228238248258268278288298308318328338348358368378388398408418428438448458468478488498508518528538548558568578588598608618628638648658668678688698708718728738748758768778788798808818828838848858868878888898908918928938948958968978988999009019029039049059069079089099109119129139149159169179189199209219229239249259269279289299309319329339349359369379389399409419429439449459469479489499509519529539549559569579589599609619629639649659669679689699709719729739749759769779789799809819829839849859869879889899909919929939949959969979989991000100110021003100410051006100710081009101010111012101310141015101610171018101910201021102210231024102510261027102810291030103110321033103410351036103710381039104010411042104310441045104610471048104910501051105210531054105510561057105810591060106110621063106410651066106710681069107010711072107310741075107610771078107910801081108210831084108510861087108810891090109110921093109410951096109710981099110011011102110311041105110611071108110911101111111211131114111511161117111811191120112111221123112411251126112711281129113011311132113311341135113611371138113911401141114211431144114511461147114811491150115111521153115411551156115711581159116011611162116311641165116611671168116911701171117211731174117511761177117811791180118111821183118411851186118711881189119011911192119311941195119611971198119912001201120212031204120512061207120812091210121112121213121412151216121712181219122012211222122312241225122612271228122912301231123212331234123512361237123812391240124112421243124412451246124712481249125012511252125312541255125612571258125912601261126212631264126512661267126812691270127112721273127412751276127712781279128012811282128312841285128612871288128912901291129212931294129512961297129812991300130113021303130413051306130713081309131013111312131313141315131613171318131913201321132213231324132513261327132813291330133113321333133413351336133713381339134013411342134313441345134613471348134913501351135213531354135513561357135813591360136113621363136413651366136713681369137013711372137313741375137613771378137913801381138213831384138513861387138813891390139113921393139413951396139713981399140014011402140314041405140614071408140914101411141214131414141514161417141814191420142114221423142414251426142714281429143014311432143314341435143614371438143914401441144214431444144514461447144814491450145114521453145414551456145714581459146014611462146314641465146614671468146914701471147214731474147514761477147814791480148114821483148414851486148714881489149014911492149314941495149614971498149915001501150215031504150515061507150815091510151115121513151415151516151715181519152015211522152315241525152615271528152915301531153215331534153515361537153815391540154115421543154415451546154715481549155015511552155315541555155615571558155915601561156215631564156515661567156815691570157115721573157415751576157715781579158015811582158315841585158615871588158915901591159215931594159515961597159815991600160116021603160416051606160716081609161016111612161316141615161616171618161916201621162216231624162516261627162816291630163116321633163416351636163716381639164016411642164316441645164616471648164916501651165216531654165516561657165816591660166116621663166416651666166716681669167016711672167316741675167616771678167916801681168216831684168516861687168816891690169116921693169416951696169716981699170017011702170317041705170617071708170917101711171217131714171517161717171817191720172117221723172417251726172717281729173017311732173317341735173617371738173917401741174217431744174517461747174817491750175117521753175417551756175717581759176017611762176317641765176617671768176917701771177217731774177517761777177817791780178117821783178417851786178717881789179017911792179317941795179617971798179918001801180218031804180518061807180818091810181118121813181418151816181718181819182018211822182318241825182618271828182918301831183218331834183518361837183818391840184118421843184418451846184718481849185018511852185318541855185618571858185918601861186218631864186518661867186818691870187118721873187418751876187718781879188018811882188318841885188618871888188918901891189218931894189518961897189818991900190119021903190419051906190719081909191019111912191319141915191619171918191919201921192219231924192519261927192819291930193119321933193419351936193719381939194019411942194319441945194619471948194919501951195219531954195519561957195819591960196119621963196419651966196719681969197019711972197319741975197619771978197919801981198219831984198519861987198819891990199119921993199419951996199719981999200020012002200320042005200620072008200920102011201220132014201520162017201820192020202120222023202420252026202720282029203020312032203320342035203620372038203920402041204220432044204520462047204820492050205120522053205420552056205720582059206020612062206320642065206620672068206920702071207220732074207520762077207820792080208120822083208420852086208720882089209020912092209320942095209620972098209921002101210221032104210521062107210821092110211121122113211421152116211721182119212021212122212321242125212621272128212921302131213221332134213521362137213821392140214121422143214421452146214721482149215021512152215321542155215621572158215921602161216221632164216521662167216821692170217121722173217421752176217721782179218021812182218321842185218621872188218921902191219221932194219521962197219821992200220122022203220422052206220722082209221022112212221322142215221622172218221922202221222222232224222522262227222822292230223122322233223422352236223722382239224022412242224322442245224622472248224922502251225222532254225522562257225822592260226122622263226422652266226722682269227022712272227322742275227622772278227922802281228222832284228522862287228822892290229122922293229422952296229722982299230023012302230323042305230623072308230923102311231223132314231523162317231823192320232123222323232423252326232723282329233023312332233323342335233623372338233923402341234223432344234523462347234823492350235123522353235423552356235723582359236023612362236323642365236623672368236923702371237223732374237523762377237823792380238123822383238423852386238723882389239023912392239323942395239623972398239924002401240224032404240524062407240824092410241124122413241424152416241724182419242024212422242324242425242624272428242924302431243224332434243524362437243824392440244124422443244424452446244724482449245024512452245324542455245624572458245924602461246224632464246524662467246824692470247124722473247424752476247724782479248024812482248324842485248624872488248924902491249224932494249524962497249824992500250125022503250425052506250725082509251025112512251325142515251625172518251925202521252225232524252525262527252825292530253125322533253425352536253725382539254025412542254325442545254625472548254925502551255225532554255525562557255825592560256125622563256425652566256725682569257025712572257325742575257625772578257925802581258225832584258525862587258825892590259125922593259425952596259725982599260026012602260326042605260626072608260926102611261226132614261526162617261826192620262126222623262426252626262726282629263026312632263326342635263626372638263926402641264226432644264526462647264826492650265126522653265426552656265726582659266026612662266326642665266626672668266926702671267226732674267526762677267826792680268126822683268426852686268726882689269026912692269326942695269626972698269927002701270227032704270527062707270827092710271127122713271427152716271727182719272027212722272327242725272627272728272927302731273227332734273527362737273827392740274127422743274427452746274727482749275027512752275327542755275627572758275927602761276227632764276527662767276827692770277127722773277427752776277727782779278027812782278327842785278627872788278927902791279227932794279527962797279827992800280128022803280428052806280728082809281028112812281328142815281628172818281928202821282228232824282528262827282828292830283128322833283428352836283728382839284028412842284328442845284628472848284928502851285228532854285528562857285828592860286128622863286428652866286728682869287028712872287328742875287628772878287928802881288228832884288528862887288828892890289128922893289428952896289728982899290029012902290329042905290629072908290929102911291229132914291529162917291829192920292129222923292429252926292729282929293029312932293329342935293629372938293929402941294229432944294529462947294829492950295129522953295429552956295729582959296029612962296329642965296629672968296929702971297229732974297529762977297829792980298129822983298

Lys Val Arg Asn Val Lys Asp Lys Val Met  
145 150

<210> 12  
<211> 268  
<212> PRT  
<213> Mus musculus

<400> 12  
Ser Cys Leu Lys Glu Glu Arg Lys Ile Leu Glu Asn Ala Gln Arg Phe  
1 5 10 15  
Asn Gln Ala Gln Ser Gly Asn Ile Gln Ser Thr Val Met Leu Asp Lys  
20 25 30  
Gln Lys Glu Leu Asp Ser Lys Val Arg Asn Val Lys Asp Lys Val Met  
35 40 45  
Cys Ile Glu His Glu Ile Lys Ser Leu Glu Asp Leu Gln Asp Glu Tyr  
50 55 60  
Asp Phe Lys Cys Lys Thr Leu Gln Asn Arg Glu His Glu Thr Asn Gly  
65 70 75 80  
Val Ala Lys Ser Asp Gln Lys Gln Glu Gln Leu Leu Lys Lys Met  
85 90 95  
Tyr Leu Met Leu Asp Asn Lys Arg Lys Glu Val Val His Lys Ile Ile  
100 105 110  
Glu Leu Leu Asn Val Thr Glu Leu Thr Gln Asn Ala Leu Ile Asn Asp  
115 120 125  
Glu Leu Val Glu Trp Lys Arg Arg Gln Gln Ser Ala Cys Ile Gly Gly  
130 135 140  
Pro Pro Asn Ala Cys Leu Asp Gln Leu Gln Asn Trp Phe Thr Ile Val  
145 150 155 160  
Ala Glu Ser Leu Gln Gln Val Arg Gln Gln Leu Lys Lys Leu Glu Glu  
165 170 175  
Leu Glu Gln Lys Tyr Thr Tyr Glu His Asp Pro Ile Thr Lys Asn Lys  
180 185 190  
Gln Val Leu Trp Asp Arg Thr Phe Ser Leu Phe Gln Gln Leu Ile Gln  
195 200 205  
Ser Ser Phe Val Val Glu Arg Gln Pro Cys Met Pro Thr His Pro Gln  
210 215 220  
Arg Pro Leu Val Leu Lys Thr Gly Val Gln Phe Thr Val Lys Leu Arg  
225 230 235 240  
Leu Leu Val Lys Leu Gln Glu Leu Asn Tyr Asn Leu Lys Val Lys Val  
245 250 255  
Leu Phe Asp Lys Asp Val Asn Glu Arg Asn Thr Val  
260 265





Val Gln His Arg Pro Met Leu Glu Glu Arg Ile Val Glu Leu Phe Arg  
195 200 205

Asn Leu Met Lys Ser Ala Phe Val Val Glu Arg Gln Pro Cys Met Pro  
210 215 220

Met His Pro Asp Arg Pro Leu Val Ile Lys Thr Gly Val Gln Phe Thr  
225 230 235 240

Thr Lys Val Arg Leu Leu Val Lys Phe Pro Glu Leu  
245 250

<210> 15

<211> 236

<212> PRT

<213> Mus musculus

<400> 15

Arg Cys Leu Trp Glu Glu Ser Arg Leu Leu Gln Thr Ala Ala Thr Ala  
1 5 10 15

Ala Gln Gln Gly Gly Gln Ala Asn His Pro Thr Ala Ala Val Val Thr  
20 25 30

Glu Lys Gln Gln Met Leu Glu Gln His Leu Gln Asp Val Arg Lys Arg  
35 40 45

Val Gln Asp Leu Glu Gln Lys Met Lys Val Val Glu Asn Leu Gln Asp  
50 55 60

Asp Phe Asp Phe Asn Tyr Lys Thr Leu Lys Ser Gln Gly Asp Met Gln  
65 70 75 80

Asp Leu Asn Gly Asn Asn Gln Ser Val Thr Arg Gln Lys Met Gln Gln  
85 90 95

Leu Glu Gln Met Leu Thr Ala Leu Asp Gln Met Arg Arg Ser Ile Val  
100 105 110

Ser Glu Leu Ala Gly Leu Leu Ser Ala Met Glu Tyr Val Gln Lys Thr  
115 120 125

Leu Thr Asp Glu Glu Leu Ala Asp Trp Lys Arg Arg Pro Glu Ile Ala  
130 135 140

Cys Ile Gly Gly Pro Pro Asn Ile Cys Leu Asp Arg Leu Glu Asn Trp  
145 150 155 160

Ile Thr Ser Leu Ala Glu Ser Gln Leu Gln Thr Arg Gln Gln Ile Lys  
165 170 175

Lys Leu Glu Glu Leu Gln Gln Lys Val Ser Tyr Lys Gly Asp Pro Ile  
180 185 190

Val Gln His Arg Pro Met Leu Glu Glu Arg Ile Val Glu Leu Phe Arg  
195 200 205

Asn Leu Met Lys Ser Ala Phe Val Val Glu Arg Gln Pro Cys Met Pro  
210 215 220

Met His Pro Asp Arg Pro Leu Val Ile Lys Thr Gly  
225 230 235

<210> 16  
<211> 176  
<212> PRT  
<213> Mus musculus

<400> 16  
Arg Cys Leu Trp Glu Glu Ser Arg Leu Leu Gln Thr Ala Ala Thr Ala  
1 5 10 15  
Ala Gln Gln Gly Gly Gln Ala Asn His Pro Thr Ala Ala Val Val Thr  
20 25 30  
Glu Lys Gln Gln Met Leu Glu Gln His Leu Gln Asp Val Arg Lys Arg  
35 40 45  
Val Gln Asp Leu Glu Gln Lys Met Lys Val Val Glu Asn Leu Gln Asp  
50 55 60  
Asp Phe Asp Phe Asn Tyr Lys Thr Leu Lys Ser Gln Gly Asp Met Gln  
65 70 75 80  
Asp Leu Asn Gly Asn Asn Gln Ser Val Thr Arg Gln Lys Met Gln Gln  
85 90 95  
Leu Glu Gln Met Leu Thr Ala Leu Asp Gln Met Arg Arg Ser Ile Val  
100 105 110  
Ser Glu Leu Ala Gly Leu Leu Ser Ala Met Glu Tyr Val Gln Lys Thr  
115 120 125  
Leu Thr Asp Glu Glu Leu Ala Asp Trp Lys Arg Arg Pro Glu Ile Ala  
130 135 140  
Cys Ile Gly Gly Pro Pro Asn Ile Cys Leu Asp Arg Leu Glu Asn Trp  
145 150 155 160  
Ile Thr Ser Leu Ala Glu Ser Gln Leu Gln Thr Arg Gln Gln Ile Lys  
165 170 175

<210> 17  
<211> 143  
<212> PRT  
<213> Mus musculus

<400> 17  
Arg Cys Leu Trp Glu Glu Ser Arg Leu Leu Gln Thr Ala Ala Thr Ala  
1 5 10 15  
Ala Gln Gln Gly Gly Gln Ala Asn His Pro Thr Ala Ala Val Val Thr  
20 25 30  
Glu Lys Gln Gln Met Leu Glu Gln His Leu Gln Asp Val Arg Lys Arg

35

40

45

Val Gln Asp Leu Glu Gln Lys Met Lys Val Val Glu Asn Leu Gln Asp  
50 55 60

Asp Phe Asp Phe Asn Tyr Lys Thr Leu Lys Ser Gln Gly Asp Met Gln  
65 70 75 80

Asp Leu Asn Gly Asn Asn Gln Ser Val Thr Arg Gln Lys Met Gln Gln  
85 90 95

Leu Glu Gln Met Leu Thr Ala Leu Asp Gln Met Arg Arg Ser Ile Val  
100 105 110

Ser Glu Leu Ala Gly Leu Leu Ser Ala Met Glu Tyr Val Gln Lys Thr  
115 120 125

Leu Thr Asp Glu Glu Leu Ala Asp Trp Lys Arg Arg Pro Glu Ile  
130 135 140

<210> 18

<211> 229

<212> PRT

<213> Mus musculus

<400> 18

Asn His Pro Thr Ala Ala Val Val Thr Glu Lys Gln Gln Met Leu Glu  
1 5 10 15

Gln His Leu Gln Asp Val Arg Lys Arg Val Gln Asp Leu Glu Gln Lys  
20 25 30

Met Lys Val Val Glu Asn Leu Gln Asp Asp Phe Asp Phe Asn Tyr Lys  
35 40 45

Thr Leu Lys Ser Gln Gly Asp Met Gln Asp Leu Asn Gly Asn Asn Gln  
50 55 60

Ser Val Thr Arg Gln Lys Met Gln Gln Leu Glu Gln Met Leu Thr Ala  
65 70 75 80

Leu Asp Gln Met Arg Arg Ser Ile Val Ser Glu Leu Ala Gly Leu Leu  
85 90 95

Ser Ala Met Glu Tyr Val Gln Lys Thr Leu Thr Asp Glu Glu Leu Ala  
100 105 110

Asp Trp Lys Arg Arg Pro Glu Ile Ala Cys Ile Gly Gly Pro Pro Asn  
115 120 125

Ile Cys Leu Asp Arg Leu Glu Asn Trp Ile Thr Ser Leu Ala Glu Ser  
130 135 140

Gln Leu Gln Thr Arg Gln Gln Ile Lys Lys Leu Glu Glu Leu Gln Gln  
145 150 155 160

Lys Val Ser Tyr Lys Gly Asp Pro Ile Val Gln His Arg Pro Met Leu  
165 170 175

Glu Glu Arg Ile Val Glu Leu Phe Arg Asn Leu Met Lys Ser Ala Phe

10000105.030402

180

185

190

Val Val Glu Arg Gln Pro Cys Met Pro Met His Pro Asp Arg Pro Leu  
195 200 205

Val Ile Lys Thr Gly Val Gln Phe Thr Thr Lys Val Arg Leu Leu Val  
210 215 220

Lys Phe Pro Glu Leu  
225

<210> 19

<211> 213

<212> PRT

<213> Mus musculus

<400> 19

Asn His Pro Thr Ala Ala Val Val Thr Glu Lys Gln Gln Met Leu Glu  
1 5 10 15

Gln His Leu Gln Asp Val Arg Lys Arg Val Gln Asp Leu Glu Gln Lys  
20 25 30

Met Lys Val Val Glu Asn Leu Gln Asp Asp Phe Asp Phe Asn Tyr Lys  
35 40 45

Thr Leu Lys Ser Gln Gly Asp Met Gln Asp Leu Asn Gly Asn Asn Gln  
50 55 60

Ser Val Thr Arg Gln Lys Met Gln Gln Leu Glu Gln Met Leu Thr Ala  
65 70 75 80

Leu Asp Gln Met Arg Arg Ser Ile Val Ser Glu Leu Ala Gly Leu Leu  
85 90 95

Ser Ala Met Glu Tyr Val Gln Lys Thr Leu Thr Asp Glu Glu Leu Ala  
100 105 110

Asp Trp Lys Arg Arg Pro Glu Ile Ala Cys Ile Gly Gly Pro Pro Asn  
115 120 125

Ile Cys Leu Asp Arg Leu Glu Asn Trp Ile Thr Ser Leu Ala Glu Ser  
130 135 140

Gln Leu Gln Thr Arg Gln Gln Ile Lys Lys Leu Glu Glu Leu Gln Gln  
145 150 155 160

Lys Val Ser Tyr Lys Gly Asp Pro Ile Val Gln His Arg Pro Met Leu  
165 170 175

Glu Glu Arg Ile Val Glu Leu Phe Arg Asn Leu Met Lys Ser Ala Phe  
180 185 190

Val Val Glu Arg Gln Pro Cys Met Pro Met His Pro Asp Arg Pro Leu  
195 200 205

Val Ile Lys Thr Gly  
210

<210> 20  
 <211> 128  
 <212> PRT  
 <213> Mus musculus

<400> 20  
 Val Gln Asp Leu Glu Gln Lys Met Lys Val Val Glu Asn Leu Gln Asp  
 1 5 10 15  
 Asp Phe Asp Phe Asn Tyr Lys Thr Leu Lys Ser Gln Gly Asp Met Gln  
 20 25 30  
 Asp Leu Asn Gly Asn Asn Gln Ser Val Thr Arg Gln Lys Met Gln Gln  
 35 40 45  
 Leu Glu Gln Met Leu Thr Ala Leu Asp Gln Met Arg Arg Ser Ile Val  
 50 55 60  
 Ser Glu Leu Ala Gly Leu Leu Ser Ala Met Glu Tyr Val Gln Lys Thr  
 65 70 75 80  
 Leu Thr Asp Glu Glu Leu Ala Asp Trp Lys Arg Arg Pro Glu Ile Ala  
 85 90 95  
 Cys Ile Gly Gly Pro Pro Asn Ile Cys Leu Asp Arg Leu Glu Asn Trp  
 100 105 110  
 Ile Thr Ser Leu Ala Glu Ser Gln Leu Gln Thr Arg Gln Gln Ile Lys  
 115 120 125

<210> 21  
 <211> 95  
 <212> PRT  
 <213> Mus musculus

<400> 21  
 Val Gln Asp Leu Glu Gln Lys Met Lys Val Val Glu Asn Leu Gln Asp  
 1 5 10 15  
 Asp Phe Asp Phe Asn Tyr Lys Thr Leu Lys Ser Gln Gly Asp Met Gln  
 20 25 30  
 Asp Leu Asn Gly Asn Asn Gln Ser Val Thr Arg Gln Lys Met Gln Gln  
 35 40 45  
 Leu Glu Gln Met Leu Thr Ala Leu Asp Gln Met Arg Arg Ser Ile Val  
 50 55 60  
 Ser Glu Leu Ala Gly Leu Leu Ser Ala Met Glu Tyr Val Gln Lys Thr  
 65 70 75 80  
 Leu Thr Asp Glu Glu Leu Ala Asp Trp Lys Arg Arg Pro Glu Ile  
 85 90 95

<210> 22  
 <211> 223

1000185-030402



Ala Asp Trp Lys Arg Arg Pro Glu Ile Ala Cys Ile Gly Gly Pro Pro  
50 55 60

Asn Ile Cys Leu Asp Arg Leu Glu Asn Trp Ile Thr Ser Leu Ala Glu  
65 70 75 80

Ser Gln Leu Gln Thr Arg Gln Gln Ile Lys Lys Leu Glu Glu Leu Gln  
85 90 95

Gln Lys Val Ser Tyr Lys Gly Asp Pro Ile Val Gln His Arg Pro Met  
100 105 110

Leu Glu Glu Arg Ile Val Glu Leu Phe Arg Asn Leu Met Lys Ser Ala  
115 120 125

Phe Val Val Glu Arg Gln Pro Cys Met Pro Met His Pro Asp Arg Pro  
130 135 140

Leu Val Ile Lys Thr Gly Val Gln Phe Thr Thr Lys Val Arg Leu Leu  
145 150 155 160

Val Lys Phe Pro Glu Leu Asn Tyr Gln Leu Lys Ile Lys Val Cys Ile  
165 170 175

Asp Lys Asp Ser Gly Asp Val Ala Ala  
180 185

<210> 24

<211> 129

<212> PRT

<213> Mus musculus

<400> 24

Ile Ala Cys Ile Gly Gly Pro Pro Asn Ile Cys Leu Asp Arg Leu Glu  
1 5 10 15

Asn Trp Ile Thr Ser Leu Ala Glu Ser Gln Leu Gln Thr Arg Gln Gln  
20 25 30

Ile Lys Lys Leu Glu Glu Leu Gln Gln Lys Val Ser Tyr Lys Gly Asp  
35 40 45

Pro Ile Val Gln His Arg Pro Met Leu Glu Glu Arg Ile Val Glu Leu  
50 55 60

Phe Arg Asn Leu Met Lys Ser Ala Phe Val Val Glu Arg Gln Pro Cys  
65 70 75 80

Met Pro Met His Pro Asp Arg Pro Leu Val Ile Lys Thr Gly Val Gln  
85 90 95

Phe Thr Thr Lys Val Arg Leu Leu Val Lys Phe Pro Glu Leu Asn Tyr  
100 105 110

Gln Leu Lys Ile Lys Val Cys Ile Asp Lys Asp Ser Gly Asp Val Ala  
115 120 125

Ala

1000105-100002

100015 - 03402

```

<210> 26
<211> 104
<212> PRT
<213> Rattus sp.

<400> 26
Met Thr Ala Lys Met Glu Thr Thr Phe Tyr Asp Asp Ala Leu Asn Ala
 1          5          10          15
Ser Phe Leu Gln Ser Glu Ser Gly Ala Tyr Gly Ala Tyr Gly Tyr Ser
          20          25          30
Asn Pro Lys Ile Leu Lys Gln Ser Met Thr Leu Asn Leu Ala Asp Pro
          35          40          45
Val Gly Asn Leu Lys Pro His Leu Arg Ala Lys Asn Ser Asp Leu Leu
          50          55          60
Thr Ser Pro Asp Val Gly Leu Leu Lys Leu Ala Ser Pro Glu Leu Glu
          65          70          75          80
Arg Leu Ile Ile Gln Ser Ser Asn Gly His Ile Thr Thr Thr Pro Thr
          85          90          95
Pro Thr Gln Phe Leu Cys Pro Lys
          100

```

```
<210> 27
<211> 230
<212> PRT
```

Case	Year	Age	Sex	Location	Outcome
1	1998	10	M	USA	Survived
2	1999	12	F	USA	Survived
3	2000	11	M	USA	Survived
4	2001	13	F	USA	Survived
5	2002	14	M	USA	Survived
6	2003	15	F	USA	Survived
7	2004	16	M	USA	Survived
8	2005	17	F	USA	Survived
9	2006	18	M	USA	Survived
10	2007	19	F	USA	Survived
11	2008	20	M	USA	Survived
12	2009	21	F	USA	Survived
13	2010	22	M	USA	Survived
14	2011	23	F	USA	Survived
15	2012	24	M	USA	Survived
16	2013	25	F	USA	Survived
17	2014	26	M	USA	Survived
18	2015	27	F	USA	Survived
19	2016	28	M	USA	Survived
20	2017	29	F	USA	Survived
21	2018	30	M	USA	Survived
22	2019	31	F	USA	Survived
23	2020	32	M	USA	Survived
24	2021	33	F	USA	Survived
25	2022	34	M	USA	Survived
26	2023	35	F	USA	Survived
27	2024	36	M	USA	Survived
28	2025	37	F	USA	Survived
29	2026	38	M	USA	Survived
30	2027	39	F	USA	Survived
31	2028	40	M	USA	Survived
32	2029	41	F	USA	Survived
33	2030	42	M	USA	Survived
34	2031	43	F	USA	Survived
35	2032	44	M	USA	Survived
36	2033	45	F	USA	Survived
37	2034	46	M	USA	Survived
38	2035	47	F	USA	Survived
39	2036	48	M	USA	Survived
40	2037	49	F	USA	Survived
41	2038	50	M	USA	Survived
42	2039	51	F	USA	Survived
43	2040	52	M	USA	Survived
44	2041	53	F	USA	Survived
45	2042	54	M	USA	Survived
46	2043	55	F	USA	Survived
47	2044	56	M	USA	Survived
48	2045	57	F	USA	Survived
49	2046	58	M	USA	Survived
50	2047	59	F	USA	Survived
51	2048	60	M	USA	Survived
52	2049	61	F	USA	Survived
53	2050	62	M	USA	Survived
54	2051	63	F	USA	Survived
55	2052	64	M	USA	Survived
56	2053	65	F	USA	Survived
57	2054	66	M	USA	Survived
58	2055	67	F	USA	Survived
59	2056	68	M	USA	Survived
60	2057	69	F	USA	Survived
61	2058	70	M	USA	Survived
62	2059	71	F	USA	Survived
63	2060	72	M	USA	Survived
64	2061	73	F	USA	Survived
65	2062	74	M	USA	Survived
66	2063	75	F	USA	Survived
67	2064	76	M	USA	Survived
68	2065	77	F	USA	Survived
69	2066	78	M	USA	Survived
70	2067	79	F	USA	Survived
71	2068	80	M	USA	Survived
72	2069	81	F	USA	Survived
73	2070	82	M	USA	Survived
74	2071	83	F	USA	Survived
75	2072	84	M	USA	

Asn Val Thr Asp Glu Gln Glu Gly Phe Ala Glu Gly Phe Val Arg Gly  
1 5 10 15

Ala Gln Pro Val Ser Gly Ala Gly Met Val Ala Pro Ala Val Ala Ser  
35 40 45

Val Ala Gly Ala Gly Gly Gly Tyr Ser Ala Thr Leu Gln Ser Glu  
50 55 60

Pro Pro Val Tyr Ala Asn Leu Ser Asn Phe Asn Pro Gly Ala Leu Ser  
65 70 75 80

Thr Gly Gly Gly Ala Pro Ser Tyr Gly Ala Thr Gly Leu Ala Phe Pro  
85 90 95

Ser Arg Pro Gln Gln Gln Gln Gln Pro Pro Gln Pro Pro His His Leu  
100 105 110

Pro Gln Gln Ile Pro Val Gln His Pro Arg Leu Gln Ala Leu Lys Glu  
115 120 125

Glu Pro Gln Thr Val Pro Glu Met Pro Gly Glu Thr Pro Pro Leu Ser  
130 135 140

Pro Ile Asp Met Glu Ser Gln Glu Arg Ile Lys Ala Glu Arg Lys Arg  
145 150 155 160

Met Arg Asn Arg Ile Ala Ala Ser Lys Cys Arg Lys Arg Lys Leu Glu  
165 170 175

Arg Ile Ala Arg Leu Glu Glu Lys Val Lys Thr Phe Lys Ala Gln Asn  
180 185 190

Ser Glu Leu Ala Ser Thr Ala Asn Met Leu Arg Glu Gln Val Ala Gln  
195 200 205

Leu Lys Gln Lys Val Met Asn His Val Asn Ser Gly Cys Gln Leu Met  
210 215 220

Leu Thr Gln Gln Leu Gln  
225 230

&lt;211&gt; 229

&lt;212&gt; PRT

<213> Mus musculus

Asn His Pro Thr Ala Ala Val Val Thr Glu Lys Gln Gln Met Leu Glu  
1 5 10 15

Gln His Leu Gln Asp Val Arg Lys Arg Val Gln Asp Leu Glu Gln Lys  
20 25 30

Met Lys Val Val Glu Asn Leu Gln Asp Asp Phe Asp Phe Asn Tyr Lys  
35 40 45

Thr Leu Lys Ser Gln Gly Asp Met Gln Asp Leu Asn Gly Asn Asn Gln  
50 55 60

Ser Val Thr Arg Gln Lys Met Gln Gln Leu Glu Gln Met Leu Thr Ala  
65 70 75 80

Leu Asp Gln Met Arg Arg Ser Ile Val Ser Glu Leu Ala Gly Leu Leu  
85 90 95

Ser Ala Met Glu Tyr Val Gln Lys Thr Leu Thr Asp Glu Glu Leu Ala  
100 105 110

Asp Trp Lys Arg Arg Pro Glu Ile Ala Cys Ile Gly Gly Pro Pro Asn  
115 120 125

Ile Cys Leu Asp Arg Leu Glu Asn Trp Ile Thr Ser Leu Ala Glu Ser  
130 135 140

Gln Leu Gln Thr Arg Gln Gln Ile Lys Lys Leu Glu Glu Leu Gln Gln  
145 150 155 160

Lys Val Ser Tyr Lys Gly Asp Pro Ile Val Gln His Arg Pro Met Leu  
165 170 175

Glu Glu Arg Ile Val Glu Leu Phe Arg Asn Leu Met Lys Ser Ala Phe  
180 185 190

Val Val Glu Arg Gln Pro Cys Met Pro Met His Pro Asp Arg Pro Leu  
195 200 205

Val Ile Lys Thr Gly Val Gln Phe Thr Thr Lys Val Arg Leu Leu Val  
210 215 220

Lys Phe Pro Glu Leu  
225

<210> 29  
<211> 229  
<212> PRT  
<213> Mus musculus

<400> 29  
Asn His Pro Thr Ala Ala Val Val Thr Glu Lys Gln Gln Met Leu Glu  
1 5 10 15

Gln His Leu Gln Asp Val Arg Lys Arg Val Gln Asp Leu Glu Gln Lys  
20 25 30

Met Lys Val Val Glu Asn Leu Gln Asp Asp Phe Asp Phe Asn Tyr Lys  
35 40 45

Thr Leu Lys Ser Gln Gly Asp Met Gln Asp Leu Asn Gly Asn Asn Gln  
50 55 60

Ser Val Thr Arg Gln Lys Met Gln Gln Leu Glu Gln Met Leu Thr Ala  
65 70 75 80

1000185-030402

Leu Asp Gln Met Arg Arg Ser Ile Val Ser Glu Leu Ala Gly Leu Leu  
 85 95  
 Ser Ala Met Glu Tyr Val Gln Lys Thr Leu Thr Asp Glu Glu Leu Ala  
 100 105 110  
 Asp Trp Lys Arg Arg Pro Glu Ile Ala Cys Ile Gly Gly Pro Pro Asn  
 115 120 125  
 Ile Cys Leu Asp Arg Leu Glu Asn Trp Ile Thr Ser Leu Ala Glu Ser  
 130 135 140  
 Gln Leu Gln Thr Arg Gln Gln Ile Lys Lys Leu Glu Glu Leu Gln Gln  
 145 150 155 160  
 Lys Val Ser Tyr Lys Gly Asp Pro Ile Val Gln His Arg Pro Met Leu  
 165 170 175  
 Glu Glu Arg Ile Val Glu Leu Phe Arg Asn Leu Met Lys Ser Ala Phe  
 180 185 190  
 Val Val Glu Arg Gln Pro Cys Met Pro Met His Pro Asp Arg Pro Leu  
 195 200 205  
 Val Ile Lys Thr Gly Val Gln Phe Ala Thr Ala Val Ala Leu Leu Val  
 210 215 220  
 Lys Phe Pro Glu Leu  
 225  
 <210> 30  
 <211> 229  
 <212> PRT  
 <213> Mus musculus  
 <400> 30  
 Asn His Pro Thr Ala Ala Val Val Thr Glu Lys Gln Gln Met Leu Glu  
 1 5 10 15  
 Gln His Ala Gln Asp Val Arg Lys Arg Val Gln Asp Leu Glu Gln Lys  
 20 25 30  
 Met Lys Val Val Glu Asn Leu Gln Asp Asp Phe Asp Phe Asn Tyr Lys  
 35 40 45  
 Thr Leu Lys Ser Gln Gly Asp Met Gln Asp Leu Asn Gly Asn Asn Gln  
 50 55 60  
 Ser Val Thr Arg Gln Lys Met Gln Gln Leu Glu Gln Met Leu Thr Ala  
 65 70 75 80  
 Leu Asp Gln Met Arg Arg Ser Ile Val Ser Glu Leu Ala Gly Leu Leu  
 85 90 95  
 Ser Ala Met Glu Tyr Val Gln Lys Thr Leu Thr Asp Glu Glu Leu Ala  
 100 105 110  
 Asp Trp Lys Arg Arg Pro Glu Ile Ala Cys Ile Gly Gly Pro Pro Asn  
 115 120 125

1000185-030402

Ile Cys Leu Asp Arg Leu Glu Asn Trp Ile Thr Ser Leu Ala Glu Ser  
130 135 140

Gln Leu Gln Thr Arg Gln Gln Ile Lys Lys Leu Glu Glu Leu Gln Gln  
145 150 155 160

Lys Val Ser Tyr Lys Gly Asp Pro Ile Val Gln His Arg Pro Met Leu  
165 170 175

Glu Glu Arg Ile Val Glu Leu Phe Arg Asn Leu Met Lys Ser Ala Phe  
180 185 190

Val Val Glu Arg Gln Pro Cys Met Pro Met His Pro Asp Arg Pro Leu  
195 200 205

Val Ile Lys Thr Gly Val Gln Phe Thr Thr Lys Val Arg Leu Leu Val  
210 215 220

Lys Phe Pro Glu Leu  
225

<210> 31

<211> 229

<212> PRT

<213> Mus musculus

<400> 31

Asn His Pro Thr Ala Ala Val Val Thr Glu Lys Gln Gln Met Leu Glu  
1 5 10 15

Gln His Leu Gln Asp Ala Arg Lys Arg Val Gln Asp Leu Glu Gln Lys  
20 25 30

Met Lys Val Val Glu Asn Leu Gln Asp Asp Phe Asp Phe Asn Tyr Lys  
35 40 45

Thr Leu Lys Ser Gln Gly Asp Met Gln Asp Leu Asn Gly Asn Asn Gln  
50 55 60

Ser Val Thr Arg Gln Lys Met Gln Gln Leu Glu Gln Met Leu Thr Ala  
65 70 75 80

Leu Asp Gln Met Arg Arg Ser Ile Val Ser Glu Leu Ala Gly Leu Leu  
85 90 95

Ser Ala Met Glu Tyr Val Gln Lys Thr Leu Thr Asp Glu Glu Leu Ala  
100 105 110

Asp Trp Lys Arg Arg Pro Glu Ile Ala Cys Ile Gly Gly Pro Pro Asn  
115 120 125

Ile Cys Leu Asp Arg Leu Glu Asn Trp Ile Thr Ser Leu Ala Glu Ser  
130 135 140

Gln Leu Gln Thr Arg Gln Gln Ile Lys Lys Leu Glu Glu Leu Gln Gln  
145 150 155 160

Lys Val Ser Tyr Lys Gly Asp Pro Ile Val Gln His Arg Pro Met Leu  
165 170 175

10090185.020402

Glu Glu Arg Ile Val Glu Leu Phe Arg Asn Leu Met Lys Ser Ala Phe  
180 185 190

Val Val Glu Arg Gln Pro Cys Met Pro Met His Pro Asp Arg Pro Leu  
195 200 205

Val Ile Lys Thr Gly Val Gln Phe Thr Thr Lys Val Arg Leu Leu Val  
210 215 220

Lys Phe Pro Glu Leu  
225

<210> 32  
<211> 21  
<212> PRT  
<213> Homo sapien

<400> 32  
Ala Ala Val Val Thr Glu Lys Gln Gln Met Leu Glu Gln His Leu Gln  
1 5 10 15

Asp Val Arg Lys Arg  
20

<210> 33  
<211> 13  
<212> PRT  
<213> Homo sapien

<400> 33  
Gly Val Gln Phe Thr Thr Lys Val Arg Leu Leu Val Lys  
1 5 10

<210> 34  
<211> 21  
<212> PRT  
<213> Homo sapien

<400> 34  
Ser Thr Val Met Leu Asp Lys Gln Lys Glu Leu Asp Ser Lys Val Arg  
1 5 10 15

Asn Val Lys Asp Lys  
20

<210> 35  
<211> 13  
<212> PRT  
<213> Homo sapien

<400> 35  
Gly Val Gln Phe Thr Val Lys Leu Arg Leu Leu Val Lys  
1 5 10

<210> 36  
<211> 21

10090185.030402

<212> PRT  
<213> Homo sapien

<400> 36  
Glu Thr Pro Val Glu Ser Gln Gln His Glu Ile Glu Ser Arg Ile Leu  
1 5 10 15

Asp Leu Arg Ala Met  
20

<210> 37  
<211> 13  
<212> PRT  
<213> Homo sapien

<400> 37  
Gly Ser Lys Phe Thr Val Arg Thr Arg Leu Leu Val Arg  
1 5 10

<210> 38  
<211> 21  
<212> PRT  
<213> Homo sapien

<400> 38  
Ser Ser Ser Val Ser Glu Arg Gln Arg Asn Val Glu His Lys Val Ala  
1 5 10 15

Ala Ile Lys Asn Ser  
20

<210> 39  
<211> 13  
<212> PRT  
<213> Homo sapien

<400> 39  
Leu Ile Gln Phe Thr Val Lys Leu Arg Leu Leu Ile Lys  
1 5 10

<210> 40  
<211> 21  
<212> PRT  
<213> Homo sapien

<400> 40  
His Leu Gln Ile Asn Gln Thr Phe Glu Glu Leu Arg Leu Val Thr Gln  
1 5 10 15

Lys Thr Glu Asn Glu  
20

<210> 41  
<211> 13  
<212> PRT  
<213> Homo sapien

10090185.030402

<400> 41

Gln Thr Lys Phe Ala Ala Thr Val Arg Leu Leu Val Gly  
1 5 10

<210> 42

<211> 20

<212> PRT

<213> Homo sapien

<400> 42

Phe His Asn Lys Gln Glu Glu Leu Lys Phe Lys Thr Gly Leu Arg Arg  
1 5 10 15

Leu Gln His Arg  
20

<210> 43

<211> 13

<212> PRT

<213> Homo sapien

<400> 43

Gln Thr Lys Phe Gln Ala Gly Val Arg Phe Leu Leu Gly  
1 5 10

4000185.030402